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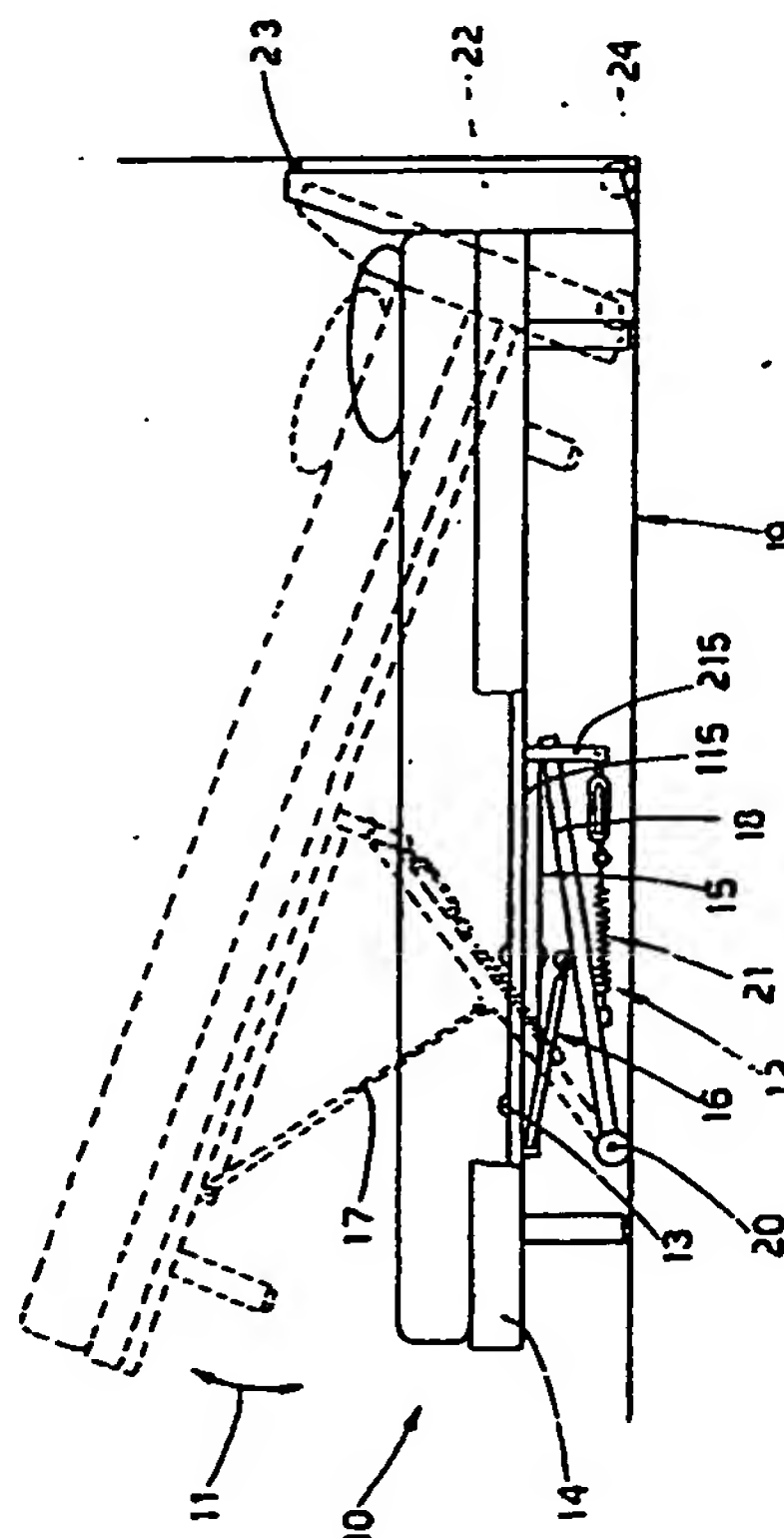
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⑤④ Method to lift beds in particular, and beds employing the method.

⑤⑦ Method to lift beds (10) in particular, in which the bed (10) is lifted at an angle (11) from a floor (19) by a lifting device (12) which is, or momentarily can be, connected to a frame (14) of the bed (10), the lifting device (12) consisting of:

- support means (15) cooperating with the frame (14),
- oscillatory means (18) which bear wheels (20) and are pivoted on the support means (15),
- lifting means (16) pivoted on the support means (15) and on the oscillatory means (18), and
- resilient resistance means (21) connected to the support means (15) and to the oscillatory means (18).

**EP 0 323 626 A1** Bed (10) which employs the above method and comprises a lifting device (12) connected or capable of being connected momentarily to the frame (14) of the bed.



## METHOD TO LIFT BEDS IN PARTICULAR, AND BEDS EMPLOYING THE METHOD

This invention concerns a method to lift beds in particular. To be more exact, the invention concerns a method which enables a bed or another like or analogous article to be lifted at an angle to the floor by exerting a minimum effort.

The invention concerns also the beds in particular which employ the method.

It is known that the part of the floor below beds and the like is the part where dust builds up most since it is the part not readily accessible to the normal cleaning methods.

The beds most widely used comprise two pairs of support feet or alternative supports which make movement of the bed hard if not impossible. The space available very often does not allow such movement to be made.

To carry out the necessary cleaning, therefore, the person who has to perform it will have to move the bed if space is available, sometimes with the help of another person, so as to reach the zone to be cleaned.

The problem is even worse if the person cannot perform such displacement by himself because he does not possess the energy to do so.

Embodiments of beds are known which comprise on the feet of the head and/or foot of the bed wheels which can be swivelled to enable the bed to be displaced substantially laterally. These embodiments are only workable in rooms of suitable sizes.

Moreover, if the bed is equipped with only one pair of wheels which can be swivelled, the problem remains unchanged, for it is still necessary to lift the side opposite to that equipped with the wheels, and the resulting difficulties mentioned above still remain.

Embodiments of beds which can be folded are also known but do not have a stable nature; such beds are those folded onto a wall or divan beds, or extensible chairs or other types; such forms have the purpose of overcoming diverse problems such as the lack of available space, for instance.

The present applicant has studied, tested and obtained a method and a bed able to overcome the problems of the known art.

The invention is disclosed in the main Claims 1 and 5, while the dependent claims describe various features of the invention.

The method according to the invention provides for the bed to be lifted at an angle to the floor by a device which is, or can be, secured to the lower side of the frame of the bed.

This device is an articulated system consisting substantially of a support element which is, or can be, connected to the frame of the bed, and of an oscillatory arm connected to the support element

and supported on the floor by rotary means; means to apply pressure are included and are connected at their ends to the support element and the oscillatory arm.

Resilient resistance means are also included and provide for tensioning of the oscillatory arm during the steps of lifting the bed and re-positioning it on the floor thereafter.

By means of the invention the operations of lifting the bed from the floor and re-positioning it thereon thereafter can be carried out with the exertion of minimum effort.

Furthermore, the bed can be moved in the vertical direction, thereby permitting access to the zone under the bed even in difficult environmental conditions or in very narrow spaces.

These and other features will be made clearer in the following description.

The attached figure, which is given as a non-restrictive example, shows a diagrammatic side view of a bed employing the method of the invention.

In the attached figure a bed 10 can be lifted in the direction of the arrow 11 to take up a position marked with lines of dashes in the figure owing to the operation of a lifting device 12.

The lifting device 12 consists of a support element 15 which is advantageously L-shaped and of which a longer side 115 is arranged lengthwise to and on the same plane as a frame 14 of the bed 10. This longer side 115 is secured to the frame 14 by suitable fixture means 13.

The lifting device 12 can also cooperate only momentarily with the bed 10, and in this event reciprocal engagement and disengagement means of a speedy type will be included.

At least one lifting means, for instance a cylinder 16 and piston of a type operated by gas or hydraulic or similar, is pivoted at the end of the longer side 115 of the support element 15.

A piston rod 17 in the cylinder 16 is pivoted in turn on an oscillatory arm 18, which bears wheels 20 at its end in contact with the floor 19.

The oscillatory arm 18 is pivoted at its other end on a shorter side 215 of the support element 15.

A resilient means, a spring 21 for instance, connects the shorter side 215 of the support element 15 to the oscillatory arm 18.

The spring 21, of which the tension can be regulated advantageously, provides tensioning of the oscillatory arm 18 and, together with the cylinder 16 and piston, enables the bed 10 to be lifted and kept in a raised position and to be repositioned on the floor 19 thereafter.

A head 22 of the bed 10 may include upper movement means, small rollers 23 for instance, and lower movement means, wheels 24 for instance.

The bed 10 in its raised position is supported on wheels 20 and 24 and therefore can also be moved very easily.

## Claims

1 - Method to lift beds (10) in particular, characterized in that the bed (10) is lifted at an angle (11) from a floor (19) by a lifting device (12) which is, or momentarily can be, connected to a frame (14) of the bed (10), the lifting device (12) consisting of:

- support means (15) cooperating with the frame (14),
- oscillatory means (18) which bear wheels (20) and are pivoted on the support means (15),
- lifting means (16) pivoted on the support means (15) and on the oscillatory means (18), and
- resilient resistance means (21) connected to the support means (15) and to the oscillatory means (18).

2 - Method as claimed in Claim 1, in which the support means (15) of the lifting device (12) consist of an L-shaped element of which a longer side (115) is connected or can be connected momentarily to the frame (14) of the bed (10).

3 - Method as claimed in Claim 1 or 2, in which the lifting means (16) are connected at one end to the longer side (115) of the support element (15).

4 - Method as claimed in any claim hereinbefore, in which the resilient resistance means (21) are connected at one end to a shorter side (215) of the support element (15).

5 - Bed (10) which employs the method of the claims hereinbefore and is characterized in that it comprises a lifting device (12) which is, or momentarily can be, connected to a frame (14) of the bed.

6 - Bed (10) as claimed in Claim 5, which comprises at its head (22) upper means (23) and lower means (24) to permit movement of the bed.

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# EUROPEAN SEARCH REPORT

Application Number

EP 88 12 1705

DOCUMENTS CONSIDERED TO BE RELEVANT			
Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (Int. Cl. 4)
A	US-A-3 341 868 (INGILDSSEN) * Whole document * -----	1-6	A 47 C 19/00
			TECHNICAL FIELDS SEARCHED (Int. Cl. 4)
			A 47 C
The present search report has been drawn up for all claims			
Place of search THE HAGUE		Date of completion of the search 28-03-1989	Examiner MYSLIWETZ W.P.
<b>CATEGORY OF CITED DOCUMENTS</b> X : particularly relevant if taken alone Y : particularly relevant if combined with another document of the same category A : technological background O : non-written disclosure P : intermediate document T : theory or principle underlying the invention E : earlier patent document, but published on, or after the filing date D : document cited in the application L : document cited for other reasons ----- & : member of the same patent family, corresponding document			

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